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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/535,763	05/20/2005	Stefan Werner	049202/289226	9269

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EXAMINER	
PAGE, BRENT T	

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1638	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/535,763	WERNER ET AL.	
	Examiner	Art Unit	
	Brent Page	1638	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *19 November 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-34* is/are pending in the application.

4a) Of the above claim(s) *7,8,15,16,20-22,24 and 32-34* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6,9-14,17-19,23 and 25-31* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *20 May 0205* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *5/2005*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

Applicant's election with traverse of Group I in the reply filed on 11/09/2007 is acknowledged. The traversal is on the ground(s) that claim 1 is not anticipated by the document cited by the Examiner in the restriction practice. This is not persuasive because the prior art does in fact disclose each limitation of claim 1 wherein all that is required is the causing of expression of a movement protein in a multicellular organism which is indeed taught in WO9521248.

The requirement is still deemed proper and is therefore made FINAL.

Claims 1-6 and 9-14, 17-19, 23, and 25-31 are examined upon the merits in the following office action.

Specification

The disclosure is objected to because it contains an embedded hyperlink and/or other form of browser-executable code. There are two links one each in paragraph 29 and paragraph 69 of the instant specification. Applicant is required to delete the embedded hyperlink and/or other form of browser-executable code. See MPEP § 608.01.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 1-6, 9-14, 17-19, 23, 25, 27 and 29-31 are rejected as being directed to non-statutory subject matter. The claims broadly claim a method of controlling a genetically modified cellular organism or a part thereof. Humans would be included in this broad limitation and are not patentable. The claims must be amended to obviate this rejection. New Matter should be avoided.

Claim Rejections - 35 USC § 112

Claims 1-6 and 9-14, 17-19, 23, and 25-31 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

The claims are broadly drawn to multi-cellular organisms and methods of controlling multicellular organisms comprising providing any genetically modified organism or cell containing any heterologous nucleic acid encoding any first polypeptide containing or consisting of a first fragment of a protein and introducing a second polypeptide into cells of said genetically modified plant, said second polypeptide containing a second fragment of said protein and a peptide sequence enabling the introduction of said second polypeptide whereby said first fragment and said second fragment jointly generate a predetermined function of said protein only when jointly present.

In contrast the specification only provides guidance for the transformation of Nicotiana plants with provectors comprising the NPT II gene, the 5' end of TMV, a movement protein and a viral coat protein, and the introduction of integrase using the VirE2 protein system for translocation of the polypeptide into the cell. The specification does not provide guidance for translocation of polypeptides into the cell using any other system, nor does the specification provide any guidance for any other genes functioning as predicted other than NPTII and GUS and the Green Fluorescent protein.

The translocation and interaction of polypeptide fragments of genes is unpredictable. In review of plant protein targeting, Mackenzie (2005 Trends in Cell Biology 15:548-554) discloses that cell environmental conditions and metabolic influences on plant protein localization are not well characterized, and therefore unpredictable (see page 551 end of first column for example). Mackenzie also discloses that when plant organellar proteins were subjected to two different in vitro translation systems, there were differences in import and dual targeting competencies.

Given the unpredictability in the art, the state of the art at the time of invention and the lack of guidance as discussed above, it would be undue experimentation for one of skill in the art to test and evaluate all systems, all peptide signals, with all plant proteins for all genes of interest to control a genetically modified plant as broadly claimed.

Claims 1-6 and 9-14, 17-19, 23, and 25-31 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claims contain subject matter which was not described in the specification in such a way as to

reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The claims are broadly drawn to multitudes of sequences that contain unspecified fragments of polypeptide sequences and unspecified lengths and activities of said polypeptides for use in method of controlling a genetically modified plant and plants therefrom.

In contrast the specification only describes the sequences of provectors comprising the NPT II gene, the 5' end of TMV, a movement protein and a viral coat protein, and the introduction of integrase using the VirE2 protein system for translocation of the polypeptide into the cell. The specification does not describe any other systems or gene sequences for use in the methods of the claimed invention.

The Federal Circuit has recently clarified the application of the written description requirement. The court stated that a written description of an invention "requires a precise definition, such as by structure, formula, [or] chemical name, of the claimed subject matter sufficient to distinguish it from other materials." University of California v. Eli Lilly and Co., 119 F.3d 1559, 1568; 43 USPQ2d 1398, 1406 (Fed. Cir. 1997). The court also concluded that "naming a type of material generally known to exist, in the absence of knowledge as to what that material consists of, is not a description of that material." Id. Further, the court held that to adequately describe a claimed genus, Patent Owner must describe a representative number of the species of the claimed genus, and that one of skill in the art should be able to "visualize or recognize the identity of the members of the genus." Id.

Finally, the court held:

> A description of a genus of cDNAs may be achieved by means of a recitation of a representative number of cDNAs, defined by nucleotide sequence, falling within the scope of the genus or a recitation of structural features common to members of the genus, which features constitute a substantial portion of the genus. Id.

See also MPEP section 2163, page 174 of chapter 2100 of the August 2005 version, column 1, bottom paragraph, where it is taught that

[T]he claimed invention as a whole may not be adequately described where an invention is described solely in terms of a method of its making coupled with its function and there is no described or art-recognized correlation or relationship between the structure of the invention and its function. A biomolecule sequence described only by a functional characteristic, without any known or disclosed correlation between that function and the structure of the sequence, normally is not a sufficient identifying characteristic for written description purposes, even when accompanied by a method of obtaining the claimed sequence.

See also Amgen Inc. v. Chugai Pharmaceutical Co. Ltd., 18 USPQ 2d 1016 at 1021, (Fed. Cir. 1991) where it is taught that a gene (which includes a promoter) is not reduced to practice until the inventor can define it by "its physical or chemical properties" (e.g. a DNA sequence).

Given the claim breadth and lack of description as discussed above, the specification fails to provide an adequate written description of the genus of sequences as broadly claimed. Given the lack of written description of the claimed genus of sequences, any method of using them, such as transforming plant cells and plants therewith, and the resultant products including the claimed transformed plant cells and plants containing the genus of sequences, would also be inadequately described. Accordingly, one skilled in the art would not have recognized Applicant to have been in possession of the claimed invention at the time of filing. See the Written Description Requirement guidelines published in Federal Register/ Vol. 66, No. 4/ Friday January 5, 2001/ Notices: pp. 1099-1111.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-3, 5-6, 9-14, 13-14, 17-19, 23, and 25-31 rejected under 35 U.S.C. 102(b) as being ainticipated by Hooykaas et al (WO0189283).

The claims are broadly drawn to multicellular organisms and methods of controlling multicellular organisms comprising providing any genetically modified organism or cell containing any heterologous nucleic acid and causing expression of a polypeptide into cells of said genetically modified plant, wherein the plant or cells contain an additional heterologous nucleic acid that controls a cellular process of interest, wherein said nucleic acid encoding protein causes the formation of an RNA and/or protein expression product, or an expressible amplicon, wherein the heterologous nucleic acid is stably integrated in the nuclear genome of said organism.

Hooykaas et al (WO0189283 published 05/21/2001) teach the translocation of the CRE polypeptide into plant cells using VirE2 and trans-splicing to achieve recombination to induce the transcription of a heterologous gene, NPTII, (See claims and Examples).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-6 and 9-14, 17-19, 23, and 25-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kimyuk et al (WO02088369) in view of Hooykaas et al (WO0189283) and further, in view of Xu et al (WO 0071701).

The claims are broadly drawn to multicellular organisms and methods of controlling multicellular organisms comprising providing any genetically modified organism or cell containing any heterologous nucleic acid and causing expression of a polypeptide into cells of said genetically modified plant, wherein the plant or cells contain an additional heterologous nucleic acid that controls a cellular process of interest, wherein said nucleic acid encoding protein causes the formation of an RNA and/or protein expression product, or an expressible amplicon, wherein the heterologous nucleic acid is stably integrated in the nuclear genome of said organism.

Kimyuk et al (WO02088369, published 11/07/2002) teach a method for expressing a nucleic acid sequence of interest in plants providing at least two precursor vectors (claim 2 and meets the limitation of additional heterologous nucleic acid) wherein the processing of the precursor is by RNA splicing, ligation and recombination (claim 13), wherein the cell provides in trans functions necessary for replicon replication, virus particle assembly (claim 18), wherein the genetic engineering is done by virus or

Agrobacterium mediated transfection wherein the process results in the expression of multiple genes of a biochemical pathway or cascade (claims 19 and 21 and 23) wherein the heterologous sequence is integrated stably into a host chromosome (claim 27), and wherein the heterologous nucleic acid introduced is a vector comprising TMV, a viral movement protein and the introduction of CRE into the cell, when jointly present with the LOX sites, commences RNA production from the amplicon (see Examples).

Kimyuk et al do not teach the intein-based trans-splicing or the introduction of a polypeptide into the cell.

Hooykaas et al (WO0189283 published 05/21/2001) teach the translocation of the CRE polypeptide into plant cells using VirE2 and trans-splicing to achieve recombination to induce the transcription of a heterologous gene, NPTII, (See claims and Examples).

Xu et al (WO0071701 published 05/23/2000) teach the use of the intein-mediated system for trans-splicing a first polypeptide fragment with a second polypeptide to achieve gene function.

Given the state of the art and the disclosures by Kimyuk et al, Hooykaas et al and Xu et al, it would have been obvious to one of ordinary skill in the art to modify the method taught by Kimyuk et al by using the system taught by Kimyuk et al to translocate recombinase into the cell as taught by Hooykaas et al and suggested by Kimyuk et al when stating "A serious concern with prior art virus-based plant expression systems is biological safety" expressing a long felt need to improve the safety of plant expression systems.

Several elements of the claims are well-known in the art and considered to be design choices. The intein trans-splicing method was known in the art at the time of invention, as was the VirE2 system of translocating polypeptides into plant cells. Further it is noted that the limitation of the claims only requires the second polypeptide to comprise "a" fragment of the first protein, and thus, an unspecified fragment may comprise any number of amino acids.

No claims are free of the prior art.

No claims are allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brent Page whose telephone number is (571)-272-5914. The examiner can normally be reached on Monday-Friday 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Anne Marie Grunberg can be reached on (571)-272-0975. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Brent T Page

RUSSELL P. KALLIS, PH.D.
PRIMARY EXAMINER

Russell Kallis